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C L A I M S

1. A system for sealing a space in a wellbore formed in an earth formation, comprising a swelleable body arranged in the wellbore in a manner so as to seal said space upon swelling of the swelleable body, the swelleable body
5 being susceptible of being in contact with formation water flowing into the wellbore, the swelleable body including a matrix material provided with a compound soluble in said formation water, wherein the matrix material substantially prevents or restricts migration of
10 the compound out of the swelleable body and allows migration of said formation water into the swelleable body by osmosis so as to induce swelling of the swelleable body upon migration of said formation water into the swelleable body.
- 15 2. The system of claim 1, wherein said matrix material is substantially impermeable to said compound or to ions of said compound.
3. The system of claim of claim 1 or 2, wherein the matrix material includes a polymer matrix material.
- 20 4. The system of claim 3, wherein the polymer matrix material is an elastomer matrix material.
5. The system of claim 4, wherein the elastomer matrix material includes a rubber selected from NBR, HNBR, XNBR, FKM, FFKM, TFE/P or EPDM base rubber.
- 25 6. The system of any one of claims 3-5, wherein the polymer matrix material is obtained or obtainable by mixing the compound in a mass of polymer material and thereafter vulcanizing the mass of polymer material to form said polymer matrix material.

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7. The system of any one of claims 1-6, wherein the compound is present in the matrix material in the form of a plurality of particles dispersed in the matrix material.

5 8. The system of claim 7, wherein the particles are substantially uniformly dispersed in the matrix material.

9. The system of claim 7 or 8, wherein the particles are embedded in the matrix material.

10 10. The system of any one of claims 1-9, wherein said compound comprises a salt, for example a dissociating salt.

11. The system of claim 10, wherein the salt is one of the group of acetates ($M-CH_3COO$), bicarbonates ($M-HCO_3$), carbonates ($M-CO_3$), formates ($M-HCO_2$), halides (M_X-
15 H_Y) ($H = Cl, Br$ or I), hydrosulphides ($M-HS$), hydroxides ($M-OH$), imides ($M-NH$), nitrates ($M-NO_3$), nitrides ($M-N$), nitrites ($M-NO_2$), phosphates ($M-PO_4$), sulphides ($M-S$) and sulphates ($M-SO_4$), where M is a metal selected from the group of metals of the periodic table.

20 12. The system of claim 10 or 11, wherein the swelleable body contains at least 20 wt% salt based on the combined weight of the matrix material and the salt, preferably at least 35 wt% salt based on the combined weight of the matrix material and the salt.

25 13. The system of any one of claims 1-12, wherein said space is an annular space formed between a tubular element extending into the wellbore and a substantially cylindrical wall surrounding the tubular element,

30 14. The system of claim 13, wherein said tubular element is a wellbore casing or wellbore liner, and said substantially cylindrical wall is the wellbore wall.

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15. The system of claim 13 or 14, wherein the swelleable body is formed by one or more rings, each ring extending around the tubular element.

5 16. The system of any one of claims 1-15, wherein the swelleable body is arranged in a portion of the wellbore opposite an earth formation layer containing said formation water.

17. The system of any one of claims 1-16, wherein the formation water is saline formation water.

10 18. A method of sealing a space in a wellbore formed in an earth formation, comprising arranging a swelleable body in the wellbore in a manner so as to seal said space upon swelling of the swelleable body, the swelleable body being susceptible of being in contact with formation
15 water flowing into the wellbore, the swelleable body including a matrix material provided with a compound soluble in said formation water, wherein the matrix material substantially prevents or restricts migration of the compound out of the swelleable body and allows
20 migration of said formation water into the swelleable body by osmosis so as to induce swelling of the swelleable body upon migration of said formation water into the swelleable body.

25 19. The method of claim 18, wherein the matrix material includes a polymer matrix material, and wherein the polymer matrix material is obtained by mixing the compound in a mass of polymer material and thereafter vulcanizing the mass of polymer material to form said polymer matrix material.

30 20. The method of claim 19, wherein the compound is mixed in the mass of polymer material in the form of a plurality of particles of the compound.

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21. The system substantially as described hereinbefore with reference to the accompanying drawing.

22. The method substantially as described hereinbefore with reference to the accompanying drawing.